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Justin L. Rubinstein

EDUCATION

Ph.D. Geophysics Thesis: Using Microearthquakes as Probes of Larger Earthquake Rupture Advisor: Gregory C. Beroza	Stanford University	March 2006
M.S. Geophysics Advisor: Gregory C. Beroza	Stanford University	2002
B.S. Applied Geophysics (Cum Laude) Advisor: Paul M. Davis	University of California Los Angeles	2000

EXPERIENCE

Mendenhall Postdoctoral Fellow <i>Earthquake Location and Fault Mechanics</i> <ul style="list-style-type: none">Identifying repeating earthquakes on the San Andreas Fault in Parkfield, CADeveloped method based on the SVD for estimating relative moment of repeating earthquakesShowed that time- and slip-predictability do not reliably predict the behavior of repeating earthquakes <i>Nonlinear Strong Ground Motion</i> <ul style="list-style-type: none">Identified nonlinear strong ground motion for small magnitude M=4, M=5 earthquakes near Parkfield	USGS – Menlo Park	2008 - present
Research Associate (Postdoc) <i>Episodic Tremor and Slip</i> <ul style="list-style-type: none">Identified 4 episodes of non-volcanic tremor in Cascadia that were triggered by distant earthquakes<ul style="list-style-type: none">Showed that the triggering of non-volcanic tremor is a simple, frictional processShowed that nonvolcanic tremor can be triggered by both the Rayleigh waves and Love waves from distant earthquakesDetermined that timing and amplitude control whether non-volcanic tremor is triggered by teleseismsIdentified 7 locations in California where non-volcanic tremor was triggered by the Denali EarthquakeShowed that non-volcanic tremor in Cascadia is modulated by the solid-earth and ocean tides	University of Washington	2006-2007
Research Assistant <i>Nonlinear Strong Ground Motion</i> <ul style="list-style-type: none">Showed that seismic velocity changes caused by large earthquakes are a result of damage caused by strong shaking (nonlinear strong ground motion)<ul style="list-style-type: none">Used coseismic velocity reduction technique to identify nonlinearity in the strong ground motion of four earthquakes:Showed that rock strength strongly influences the susceptibility to nonlinear strong shaking, including damage induced by previous earthquakes (Loma Prieta and Chittenden)Provided the first field evidence that nonlinearity in strong ground motion is limited to the very near surface (Parkfield)Used spectral ratio technique to identify nonlinear strong ground motion in the Parkfield EarthquakeReconciled strong ground motion and coseismic velocity reduction observations of nonlinear strong ground motion in the Parkfield Earthquake	Stanford University	2000-2006

Earthquake Location and Fault Mechanics

- Developed a source-array beamforming technique to determine centroids of large earthquakes previously unlocated due to clipping of high gain waveforms
 - Used source-array beamforming to locate earthquakes on the Calaveras Fault
 - Showed that seismic streaks represent a boundary between creeping and locked portions of a fault block
- Wrote a neighbor selection algorithm based upon the Delaunay Tessellation and integrated it into double difference relocation program HYPODD

NSF-REU Summer Intern **University of Alaska, Fairbanks** **1999**
• Developed crustal S-Wave velocity model for Southern and Central Alaska

SCEC Summer Intern **University of California Los Angeles** **1998**
• Investigated azimuth dependent site amplifications of Northridge aftershocks in Sherman Oaks and Santa Monica

Research Assistant **University of California Los Angeles** **1997-2000**
• Analyzed spatial variation of site amplification for Northridge aftershocks recorded by stations throughout Los Angeles

AWARDS

Stanford Graduate Fellowship **Stanford University** **2000-2003**
Awarded to top incoming graduate students

National Defense Science and Engineering Graduate (NDSEG) Fellowship Finalist **2000**
Awarded to top incoming graduate students in the sciences

University of California Regents Scholar **UCLA** **1996-2000**
Awarded to top incoming undergraduate students

Society of Exploration Geophysicists (SEG) Scholarship **SEG** **1996-2000**
Awarded to top undergraduate students in geophysics nationwide

John Handin Scholarship **UCLA Dept. Earth and Space Sciences** **1999**
Awarded yearly to top UCLA undergraduate in geophysics

PUBLICATIONS

Cascadia 2007 and Beyond Working Group, Slow Slip Phenomena in Cascadia from 2007 and Beyond: A Review, *manuscript submitted to GSA Bulletin*.

Rubinstein, J.L. and W.L. Ellsworth, Precise Estimation of Repeating Earthquake Moment: Example from Parkfield, CA. *manuscript submitted to BSSA*.

Rubinstein, J.L., Nonlinear Strong Ground Motion in Medium Magnitude Earthquakes Near Parkfield, CA, *manuscript submitted to BSSA*.

Rubinstein, J.L., D.R. Shelly, and W.L. Ellsworth (2010), Non-Volcanic Tremor: A Window into the Roots of Fault Zone, in *New Frontiers in Integrated Solid Earth Sciences*, edited by S. Cloetingh and J. Negendank, pp. 287-314, Springer Netherlands.

Rubinstein, J.L., J. Gomberg, J.E. Vidale, A.G. Wech, H. Kao, K.C. Creager, G. Rogers (2009), Seismic Wave Triggering of Non-Volcanic Tremor, ETS, and Earthquakes on Vancouver Island, *Journal of Geophysical Research*, v. 114, B00A01, doi:10.1029/2008JB005875.

Rubinstein, J.L., M. La Rocca, J.E. Vidale, K.C. Creager, A.G. Wech (2008), Tidal Modulation of Non-Volcanic Tremor, *Science*, v. 319, pp 186-189.

Gomberg, J., **J.L. Rubinstein**, Z. Peng, K.C. Creager, J.E. Vidale (2008), Widespread Triggering of Non-Volcanic Tremor in California, *Science*, v. 319, pp 173.

Rubinstein, J.L., J.E. Vidale, J. Gomberg, P. Bodin, K.C. Creager, and S.D. Malone (2007). Non-volcanic tremor driven by large transient shear stresses, *Nature*, v. 448, pp 579-582.

Rubinstein, J.L., N. Uchida, and G. Beroza (2007). Seismic Velocity Reductions Caused by the 2003 Tokachi-Oki Earthquake, *Journal of Geophysical Research*, v. 112, B05315, doi:10.1029/2006JB004440.

Rubinstein, J.L. and G. Beroza (2007). Full Waveform Earthquake Location: Application to Seismic Streaks on the Calaveras Fault, California, *Journal of Geophysical Research*, v. 112, B05303, doi:10.1029/2006B004463.

Rubinstein, J.L. and G. Beroza (2005). Depth constraints on nonlinear strong ground motion from the 2004 Parkfield earthquake, *Geophysical Research Letters*, v. 32, L14313, doi:10.1029/2005GL023189.

Rubinstein, J. L. and G. Beroza (2004). Nonlinear strong ground motion in the M_L 5.4 Chittenden Earthquake: Evidence that preexisting damage increases susceptibility to further damage, *Geophysical Research Letters*, v. 31, L23614, doi: 10.1029/2004GL021357.

Rubinstein, J. L. and G. Beroza (2004). Evidence for widespread nonlinear strong ground motion in the M_w 6.9 Loma Prieta Earthquake, *Bulletin of the Seismological Society of America*, v. 94, pp. 1595–1608.

Hooper, A., P. Segall, K. Johnson, and **J. L. Rubinstein** (2002). Reconciling seismic and geodetic models of the 1989 Kilauea South Flank Earthquake, *Geophysical Research Letters*, v. 29, pp. 19-1 – 19-4, doi: 10.1029/2002GL016156.

Davis, P., **J. L. Rubinstein**, K. Liu, S. Gao, and L. Knopoff (2000). Northridge Earthquake damage caused by geologic focusing of seismic waves, *Science*, v. 289, pp. 1746-1750.

INVITED PRESENTATIONS

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, UC Santa Cruz – IGPP Seminar, October 2009.

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, Caltech Division of Geological and Planetary Sciences Seminar, March 2009.

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, UC Berkeley Seismo-Lab Seminar, September 2008.

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, USGS Menlo Park Earthquake Seminar, June 2008.

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, Los Alamos National Laboratory – EES Seminar, April 2008.

Rubinstein, J.L., Stress Triggering of Non-Volcanic Tremor, Central Washington University, November 2007.

Rubinstein, J.L., Stress Triggering of Tremor and Slow Slip, Pacific Geoscience Centre, July 2007.

Rubinstein, J.L. Near surface damage caused by three moderate California earthquakes, Center for Earthquake and Research Information—CERI Memphis, March 2006.

Rubinstein, J.L., Near surface damage caused by three moderate California earthquakes, Lawrence Livermore National Laboratory Seismology Seminar, January 2006.

Rubinstein, J.L., Nonlinear strong ground motion in three moderate California earthquakes, UCLA Seismological Laboratory Seminar, November 2005.

Rubinstein, J.L., Nonlinear strong ground motion in three moderate California earthquakes, Berkeley Seismological Laboratory Seminar, August 2005.

Rubinstein, J.L., Nonlinear strong ground motion in three moderate California earthquakes, USGS Menlo Park Earthquake Seminar, March 2005.

Rubinstein, J.L., Nonlinear strong ground motion in three moderate California earthquakes, Istituto Nazionale di Geofisica e Vulcanologia (INGV Rome), March 2005

SELECTED CONFERENCE PRESENTATIONS

Rubinstein, J.L. and W.L. Ellsworth, Parkfield Repeating Earthquakes are Neither Time- nor Slip-Predictable, SSA 2010.

Rubinstein, J.L. and W.L. Ellsworth, Small Repeating Earthquakes are Time- and Slip-Predictable When Magnitudes are Improved, 6th International Workshop on Statistical Seismology, *INVITED*.

Rubinstein, J. L., J.E. Vidale, J. Gomberg, K.C. Creager, P. Bodin, S.D. Malone, A.G. Wech, Non-volcanic Tremor and Earthquakes Driven by the Large Transient Shear Stresses of the 2002 Denali Earthquake, AGU Fall 2007.

Rubinstein, J. L., J.E. Vidale, J. Gomberg, K.C. Creager, A. Wech, P. Bodin, S.D. Malone, Triggering of tremor by the strong shaking from distant earthquakes, GSA Cordilleran Section 2007.

Rubinstein, J. L., J.E. Vidale, K. Creager, and S. Malone, Relocating nonvolcanic tremor and high frequency earthquakes in Cascadia, AGU Fall 2006.

Rubinstein, J. L. and G. Beroza, Full-Waveform earthquake location and the mechanics of streaks on the Calaveras Fault, AGU Fall 2005.

Rubinstein, J. L. and G. Beroza, Nonlinear strong ground motion as observed by seismic velocity reductions, 10th International Workshop on Nonlinear Elasticity in Materials, July 2005.

Rubinstein, J. L. and G Beroza, Nonlinear strong ground motion in the 2004 Parkfield Earthquake, AGU Fall 2004, *INVITED*.

Rubinstein, J. L., G. Beroza, G. Bokelmann, and D. Schaff, Near surface damage caused by the strong ground motion of the M6.9 Loma Prieta and M5.4 Chittenden Earthquakes, AGU Fall 2002.

Rubinstein, J. L., Analysis of azimuthal variation in amplitude factors in Sherman Oaks and Santa Monica during the Northridge Earthquake Aftershock Sequence, SCEC 1998.

TEACHING EXPERIENCE

“Earthquakes and Volcanoes” Teaching Assistant	Stanford University	2004
<ul style="list-style-type: none">• Organized and taught lectures on intraplate earthquakes and seismic gaps• Led review sessions prior to tests• Assisted in writing homework sets• Assisted students in office hours		
Advisor of SCEC Summer Intern Kate Prudchenko	Stanford University	2004
<ul style="list-style-type: none">• Provided instruction in seismology and the basis of the project• Assisted in development of code to analyze Coda Q using repeating earthquakes		
“Earthquake Seismology” Teaching Assistant	Stanford University	2003
<ul style="list-style-type: none">• Organized and taught lecture on earthquake location and relocation• Assisted students in office hours		

FIELD EXPERIENCE

SCEC Sponsored Tri-Center Earthquake Hazards and Engineering Field Trip to Japan	2004
<ul style="list-style-type: none">• Visited universities and earthquake engineering facilities in Japan with earthquake engineering graduate students to foster improved communication between the earthquake engineering and earthquake seismology communities	
Field Assistant for BEAAR, LABPSE, and LARSE II Experiments	1997-2000
<ul style="list-style-type: none">• Assisted in array design/siting of seismometers• Obtained permissions for deployment of seismometers on private property• Installed and removed broadband and short period seismometers	

SERVICE

Convener of Special Session on Episodic Tremor and Slip

GSA 2009, Fall AGU 2007

Manuscript and Proposal Reviewer for

Journal of Geophysical Research; Bulletin of the Seismological Society of America; Geophysical Research Letters; Geophysical Journal International; Pure and Applied Geophysics; Geochemistry, Geophysics, and Geosystems (G³); the National Science Foundation; the Swiss National Science Foundation

COMPUTER SKILLS

Languages:

Matlab
Fortran 77/90
C shell/Bash

Operating Systems

Unix/Linux
Windows/DOS
Macintosh

PROFESSIONAL AFFILIATIONS

**American Geophysical Union
Seismological Society of America**

MISCELLANY

Proficient in Spanish
